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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,694	10/03/2003	Robert S. Afzal	902.0129.U1(US)	9957
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HARRINGTON & SMITH, LLP 4 RESEARCH DRIVE SHELTON, CT 06484-6212			EXAMINER MENEFFEE, JAMES A	
			ART UNIT 2828	PAPER NUMBER

DATE MAILED: 03/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/678,694

Applicant(s)

AFZAL ET AL.

Examiner

James A. Menefee

Art Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 September 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13, 25-34 and 36-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11, 25, 26, 30-34 and 36-38 is/are rejected.
- 7) ☒ Claim(s) 12, 13 and 27-29 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Response to Amendment*

By amendment filed 9/1/2005, the specification and claims 4, 7, 13, and 29 are amended.

Claims 37-38 are pending. Claims 1-13, 25-34, and 36-38 are pending.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 4, 9, 34, and 37-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Ashby et al. (US 5,463,649). See Fig. 1.

Regarding claim 1, Ashby discloses a monolithic side pumped passively Q-switched solid-state laser comprising a laser resonator composite structure comprised of a laser gain medium 14 optically contacting passive Q-switch 15, wherein the composite structure comprises end faces 16,18 forming a linear optical path therebetween, the end faces comprising at least partially reflective coatings deposited thereon, the gain medium comprising a side face for receiving pump light.

Regarding claim 2, the pump light is generated by laser diode array 12.

Regarding claim 4, the end faces comprise resonator mirrors 16,18.

Regarding claim 9, the gain medium may be Er:glass. Col. 3 lines 64-67.

Art Unit: 2828

Regarding claim 34, the end faces 18,20 are substantially parallel and orthogonal relative to a longitudinal axis of the cavity.

Regarding claim 37, Ashby's structure is a monolithic block.

Regarding claim 38, this method of forming is not germane to the patentability of the device itself and is considered a product-by-process limitation. Accordingly, only the structure is given weight, not the method of making (i.e. bonding). See MPEP 2113. The structure is the same as in Ashby.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 5-8, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ashby in view of Nettleton et al. (Applied Optics, 20 May 2000 cited previously by applicant). Ashby discloses the limitations of the claims as shown above but does not disclose the following:

Regarding claim 3, Ashby does not disclose the pump light is a flashlamp. Nettleton discloses a similar side pumped laser having a flashlamp pump. Page 2429, col. 2. It would have been obvious to one skilled in the art to use flashlamp pumping because of cost considerations and broad temperature range, as taught by Nettleton.

Regarding claim 5, Ashby does not disclose a nonlinear material coupled to the composite structure. Nettleton discloses a similar laser and further discloses a nonlinear material

Art Unit: 2828

coupled to the laser composite structure. It would have been obvious to one skilled in the art to include a nonlinear material because it can be used for frequency conversion of the laser, as taught by Nettleton.

Regarding claims 6 and 8, Nettleton's nonlinear material is an intracavity OPO. P. 2430 col. 1 first full par.

Regarding claim 7, it is not taught that the nonlinear material is external to the cavity. It is known in the art that nonlinear materials, such as harmonic generators or OPO's, may be incorporated either internal or external to a laser cavity, and it would have been obvious to one skilled in the art to use an external design via mere design choice.

Regarding claim 10, it is not disclosed that the Q-switch is Cr:YAG. Ashby does not disclose the materials of the Q-switch at all. Nettleton teaches a similar laser using a Cr:YAG Q-switch. It would have been obvious to one skilled in the art to use such materials for the Q-switch since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960).

Claims 11, 25-26, 30-32 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ashby in view of Langhans et al. (US 6,788,723).

Regarding claims 11 and 25, the limitations of the claims are disclosed as shown above by Ashby, but there is not disclosed the thermal aberration compensation means.

Langhans discloses a laser rod where the faces are rounded to compensate for thermal lensing (i.e. thermal aberration compensation). See Figs. 2b,2c. It would have been obvious to

Art Unit: 2828

one skilled in the art to make the end face of a laser rod into such a shape in order to compensate for thermal lensing, thus improving pump power and beam quality, as taught by Langhans. See col. 2 lines 10-34.

It is noted that claim 11 uses a means-plus-function format. The rounded edge of Langhans is not the same as the means described in the specification, however the examiner finds that the rounded edge is a structural equivalent to those described. The rounded edge performs the same function (thermal aberration compensation), is not excluded by the specification, and performs the identical function (thermal aberration compensation) in substantially the same way (by altering the face of the gain medium) to produce the same result (improved output due to aberration compensation), thus a prima facie case of equivalence is shown. See MPEP 2183.

Regarding claim 26, as shown above Ashby's composite structure includes a passive Q-switch.

Regarding claims 30-31, the laser of Ashby is monolithic and side pumped.

Regarding claim 32, it is not disclosed that the gain medium comprises saturable absorber material, yet such materials are known in the art. It would have been obvious to one skilled in the art to use such materials for the gain medium since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960).

Regarding claim 36, Ashby's end faces 18,20 are substantially parallel and orthogonal relative to a longitudinal axis of the cavity.

Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ashby and Langhans as applied to the claims above, and further in view of Nettleton. Ashby and Langhans teach the limitations of the claims as above, but do not teach a nonlinear material coupled to the composite structure. Nettleton teaches this with motivation as in the rejection of claim 5 above.

### ***Response to Arguments***

Applicant's arguments filed 9/1/2005 ("Response") have been fully considered and are partially persuasive.

Applicant argues that Ashby does not disclose a "composite structure" as claimed. Response at 9-10. The arguments are not persuasive.

Applicant notes how "composite structure" is described in the specification and concludes that since the description describes a free standing laser that does not include a substrate then Ashby's laser that includes a substrate cannot be a composite structure.

Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. *E-Pass Techs., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1369, 67 USPQ2d 1947, 1950 (Fed. Cir. 2003) (claims must be interpreted "in view of the specification" without importing limitations from the specification into the claims unnecessarily); *see also In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow . . ."). Nothing in the claims restricts "composite structure" to devices that are not grown on a substrate. If the

Art Unit: 2828

examiner interpreted the claims to exclude such a device he would be impermissibly reading limitations from the specification into the claims.

Regardless of how the device is described, the examiner does not find that “composite structure” has a special definition, either generally to one skilled in the art or as defined by the applicant. The description quoted in the Response is not a case of applicant being his own lexicographer, but is merely the description of the device. The term thus takes its ordinary meaning. A “composite” is “a solid material which is composed of two or more substances having different physical characteristics and in which each substance retains its identity while contributing desirable properties to the whole.” Merriam-Webster’s Collegiate Dictionary, 10th ed. (2nd entry, 4th def.). A composite structure is likewise a structure that includes a material composed of several substances. Ashby’s device fits that description. If applicant wishes to define over Ashby, further limitations should be added to the claims.

Applicant additionally notes that Ashby “requires the gain medium to be a waveguide structure and the disclosed invention does not have such a restriction.” The examiner’s response is that the claims do not restrict the gain medium from being a waveguide structure so this distinction makes no patentable difference.

Applicant argues that the tilt and Porro prism for correcting for thermal aberrations is not taught or disclosed. Response at 11-14. This argument is persuasive, and claims 12-13 and 27-29 are indicated as including allowable subject matter below.



*Allowable Subject Matter*

Claims 12-13 and 27-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 12-13, there is not taught or disclosed in the prior art a monolithic side pumped Q-switched solid state laser including gain medium and q-switch as claimed, the end faces forming a linear optical path (i.e. NOT a zig zag type of laser), and including means for thermally induced aberration compensation as claimed, i.e. a tilt or Porro prism.

Likewise regarding claims 27-29, there is not taught or disclosed a solid-state laser having two surfaces forming a linear optical path, and at least one of the surfaces comprises a tilt or Porro prism for thermal aberration compensation.

While the rejections of claims 1-10 and 34 remain the same, new grounds of rejection are presented for claims 11, 25-26, 30-33 and 36, therefore this action is again made non-final.

*Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chesler et al. (US 3,680,000) and Angeley (US 6,282,223) also show solid-state lasers having altered faces for thermal aberration compensation. Knights et al. (US 2002/0122455) shows a solid state laser having a face in the shape of a Porro prism, see, e.g., Fig. 4, but there is no suggestion the Porro prism compensates for thermal aberrations. While

Art Unit: 2828

Knights discusses thermal lensing, see par. [0030], it is not clear that the prism itself causes the compensation for thermal lensing.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (571) 272-1944. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MinSun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'James Menefee', is positioned above the printed name and date.

James Menefee  
February 27, 2006